FACT SHEET

L-710

Improve Texas Vegetables -- Sweet Potatoes

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Annual production value of sweet potatoes ranges between $5 and $6 million, contributing significantly to the annual $100 million production value of Texas vegetables.

Selection of Soil

Crop rotation in sweet potato production is important in reducing losses from nematode injury and diseases. Select fields on which sweet potatoes *have not been grown* for at least 5 years. Sandy loam soil, 18 to 24 inches deep with a clay subsoil, usually produces well-shaped sweet potato roots with a smooth skin finish. Soil types which meet these requirements are found in Northeast Texas where approximately 80 percent of the State's production is located.

Commercial growers of quality sweet potatoes practice good soil preparation prior to transplanting. Ridges about 12 inches high provide good drainage. Good soil preparation not only provides a desirable plant bed but also reduces early weed competition.

Varieties

Sweet potato varieties are selected for yield, percent of No. 1 grade, external and internal appearance, storage quality and market acceptance.

The *Porto Rico* variety has been used widely for several years. Although a long growing season is required, it has produced under adverse growing conditions. Its flavor is considered excellent, and the potato keeps well in storage. The variety is neither resistant to the internal cork virus, nor does it usually have the desirable orange interior flesh. A seedstock improvement program could correct these disadvantages.

The *Copperskin Goldrush* variety has a desirable internal color and acceptable canning and flaking characteristics. It also is considered a good storage variety. *Centennial,* a variety that has performed well through several seasons, has a high recorded percentage of No. 1 grade. Its copper skin and orange flesh have made it popular for both fresh market and processing.

Other tested varieties, which have performed well or need further testing before being recommended for trial commercial planting, are *Julian, Gem* and *Nugget.*

Seedstock

Select certified seedstock that is free of nematodes and diseases such as scurf, black rot and internal cork. For sales appeal, the internal color should range from dark yellow to orange with a desirable skin color. Competition demands more careful attention to seed stock.

Sweet potatoes mutate rapidly or the stock "runs out"—a term used by growers. Continued seedstock improvement is necessary. To improve the seed and offset the loss of internal and external color, eliminate undesirable roots from seedstock each year and remove diseased roots and those with poor skin color.

Growing a seed plot is a better method of improving the seedstock. To begin a seed plot, healthy roots from the current crop should be hill selected. The selected roots are then "nicked" about ¼-inch deep on the stem end when the roots are bedded the next season. Only those with orange-colored flesh, free of internal cork lesions, are bedded. Plants from these selected roots are used for the seed plot. The plot may be expanded by using vine cuttings. Hill selection of the seed plot improves the quality for the next season's plot. Remaining roots are saved as seedstock for the commercial field. As this process is repeated yearly, quality is improved. High quality seed is an investment in efficient production.

Approximately 10 bushels of seedstock are bedded for each acre to be planted. Depending on the size and the placement of the roots, 10 to 15 square feet of bed area accommodate a bushel of seedstock.

Slip Production

Although varieties vary in the number of slips produced, early and total slip production of most

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[1]Progress Reports may be obtained from the county agricultural agents or direct from the Department of Agricultural Information, Texas A&M University, College Station, Texas.

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A typical hill of Centennial, the current most popular variety, being examined by Todd Berry, Van Zandt County agricultural agent, (left) and L. L. Mewbourn, grower-shipper. Before release by the Louisiana Agricultural Experiment Station, the variety had been under test in the commercial area of East Texas by the Texas Agricultural Experiment Station.

A plant bed test in which various plastic mulch covering materials were compared. Note earlier transplant growth of petroleum mulch-covered beds in foreground.

Transplants from sweet potato plant beds are examined by Dr. John E. Larsen, Extension specialist—vegetables, Texas A&M University, and Lloyd Justiss, grower-shipper and president, Texas Sweet Potato Council.

A typical chain delivery commercial sweet potato harvester. M. R. "Skeets" Turbeville, grower and cooperator, is shown harvesting a fertilizer-variety trial conducted by Texas Agricultural Experiment Station. Note that the roots are conveyed on soil over the chain to lessen bruising.

Transplant growth can be controlled by growth retardant, Alar. Note short, stocky plants on left, as compared to "leggy" plants on right. (*Nagatuck Chemical Company experimental material not yet cleared by FDA for use on sweet potatoes.)*

A "labor saving" harvester used in Van Zandt County. The apparatus is pulled down the row, and workers place roots in crates.

varieties can be improved by *preheating* the seed-stock. Preheating is accomplished by raising the storage temperature to 85 degrees F. for about 2 weeks before bedding or until short sprouts appear on the roots. Prolonged temperature below 55 degrees F. in storage or plant bed results in reduced slip production and root breakdown.

Ground beds, well-drained and covered with a suitable material, usually produce plants in time for transplanting in Northeast Texas. Recent research results indicate that a petroleum mulch (Encap) material is superior to plastic film covering for early plant production. A double layer of plastic film, clear over black with an air space between, forces plants earlier than the single layer of film. One layer of black plastic film or asphalt roofing felt, however, makes a satisfactory covering. A covered bed over 4 feet wide or not well-drained usually results in low slip production because of root injury. When early plants are needed, or when plants are grown for sale, use the heated bed or plastic covered greenhouse.

Fertilizer Rates and Placement

For most efficient use and highest yields, the following rates of nitrogen (N), phosphorus (P) and potassium (K) in pounds per acre are recommended: (These rates are based on several years of research in East Texas). 50 to 100 N; 22 to 44 P; and 83 to 166 K. Eight hundred to 1,200 pounds of a complete fertilizer such as 5-10-15 should be applied. The higher rates are recommended when sweet potatoes are irrigated. For best results, place fertilizer on each side of the row, either when preparing the bed or after transplanting. In some years, placement under the center of the row may result in a loss of plant stand by burning of the roots. Broadcast placements result in inefficient fertilizer use and encourage weed growth, Progress Reports 2195 and 2231. In the South Plains, the soil usually tests high in potash, and no response to potash application has been obtained, Progress Reports 2127 and 2177.

Field Transplanting

For highest yields, set plants in the field as soon as possible after frost danger. A starter solution of soluble fertilizer applied at transplanting can increase early vine growth, resulting in less competition from weeds and a quicker "set" of roots, Progress Report 1886. Most commercial transplanters have an attachment for applying liquid starter solution.

Irrigation

For maximum yields, sweet potato plants should not suffer moisture stress. Since rainfall is always unpredictable, supplemental irrigation should be available to insure maximum fertilizer usage and highest yields, Progress Report 2254.

Harvesting

Sweet potatoes must be harvested economically without excessive injury. This can be done with hand or machine labor, but both must be supervised closely. Harvest when the roots reach a desirable market size and before the soil temperature drops below 55 degrees F. Chilling of the sweet potato roots can occur at temperatures below 55 degrees F., and, as a result, the roots may breakdown in storage.

Sweet potatoes form the quickest and most effective barrier to disease organisms when placed in a curing storage at 85 degrees F. and 90 percent relative humidity for 7 to 10 days following harvest. When the temperature and relative humidity are lower, healing is slower and shriveling may occur. Following the curing period, the sweet potatoes should be stored at 55 to 60 degrees F. and 85 percent relative humidity.

Preparing for Market

Follow all practices which reduce injury during the packing operation. Less injury not only improves the appearance of the roots but also reduces the entry places for the destructive organisms causing soft rot. Avoiding all injury is impossible during handling; however, the sweet potato has a mechanism which heals the wounds after the root has been injured. The rot organism cannot enter properly healed wounds.

Factors which help the healing process during handling for shipment are the same as those which help the healing during curing. The only difference is that the healing seems to proceed at a slower rate when a sweet potato root is handled after curing. Adequate ventilation, 85 degrees F. and 85 percent relative humidity, are conditions under which healing takes place most rapidly. In some operations, providing these optimum conditions before shipment may not be practical.

Botran, a fungicide, provides additional protection against the entry of soft rot organisms during handling and shipment. The U.S. Food and Drug Administration has established a tolerance for the material. Follow the manufacturer's recommendations and precautions.

During the late winter, considerable changes in many packing operations may be necessary to reduce losses from soft rot and Java black rot. The roots may have to be packed into the crates by hand, thereby eliminating the "drops" in the packing line. Correct parts of the packing equipment which cause excessive nicks on the sweet potato roots. Caution personnel handling the filled crates against rough treatment of the package. Prevent chilling of the roots while in transit.

Improvement of the sweet potato industry occurs when each grower or shipper improves his operation.

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